

Nursery Stock Approved Treatment Program

Annual Review

July 2009

This is a summary of the Glassy-Winged Sharpshooter (GWSS) Nursery Stock Approved Treatment Program (ATP) for the period of June 6, 2008 through June 6, 2009. This report includes analysis or discussions of every element of the ATP including historical viewpoints, statistics, regulatory issues, monitoring activities, chemical evaluations, training and documentation. This document will also discuss adjustments made to the ATP during this period and mention future considerations.

Shipments

Following the approval of the ATP in March of 2008, five nurseries expressed interest in participating in the new program: Bordiers Nursery and Valley Crest Tree Company of Ventura County, Norman's Nursery and ABC Nursery of Los Angeles County, and Village Nurseries of Riverside County.

All of the nurseries, with the exception of ABC, began shipping under the ATP during 2008. ABC Nursery began shipping in February 2009. The results below include all ATP shipments through December 31, 2008.

Nursery	# of Shipments	# of Plants
Bordiers Nursery	5	2,050
Valley Crest Tree Co.	67	1,484
Norman's Nursery	214	89,700
Village Nurseries	1,832	439,015
Total	2,118	532,249

A total of 35 counties received shipments under the ATP in 2008.

The results below include all ATP shipments from January 1 through June 5, 2009.

Nursery	# of Shipments	# of Plants
Bordiers Nursery	499	171,844
Valley Crest Tree Co.	77	1,800
Norman's Nursery	342	195,974
Village Nurseries	1741	593,641
ABC Nursery	239	39,844
Total	2,898	1,003,103

A total of 38 counties have received shipments under the ATP in 2009. All receiving counties are checking the accompanying paperwork and physically inspecting the shipments.

Documentation

The Certificate of Quarantine Compliance (CQC), certifies that a treatment application was witnessed by a licensed inspector of the origin county department of agriculture, is issued for each individual delivery of nursery stock. This document must accompany each lot at each delivery destination. The CQC, which was originally valid for only three days, is now valid for five days from the date of issue.

The Blue tag, a shipping permit, must also be issued for each individual delivery within the nursery stock shipment. It is issued by the shipping nursery and requires the destination receiver to notify the destination county and hold the shipment for inspection.

The CQC and Blue tag are required to be faxed to the Pierce's Disease Control Program (PDCP) and each receiving county 24 hours in advance of the shipment leaving the origin nursery. If the counties agree and have the capabilities, the CQC and Blue tag can be scanned and sent by e-mail to the receiving counties. This gives each destination county advance notice of the shipment and allows them to schedule their inspection coverage.

Trapping

Trapping is conducted in the nurseries to determine that the nursery meets ATP cleanliness standards. A trap cycle is defined as a trap servicing every two weeks. County trap records are forwarded to PDCP at the end of each trap cycle. The following table summarizes the trapping results for June through December 2008:

Nursery	Date ATP	Acreage in Production	Number of Traps*	# of Traps > 10 GWSS
Nursery A	5/15/2008	150	688	7
Nursery B (Yard 1)	6/6/2008	290	1256	318**
Nursery B (Yard 2)	6/6/2008	111	469	1
Nursery C (Yard 1)	7/15/2008	20	88	7
Nursery C (Yard 2)	7/28/2008	126	619	8
Nursery D (Yard 1)	8/15/2008	25	110	1
Nursery D (Yard 2)	8/15/2008	27	122	0
Nursery D (Yard 3)	8/15/2008	1	7	0
Nursery D (Yard 4)	8/15/2008	6	31	0
Nursery D (Yard 5)	8/15/2008	10	40	0
Nursery D (Yard 6)	8/15/2008	2	12	0
Nursery D (Yard 7)	8/15/2008	8	34	2
Nursery D (Yard 8)	8/15/2008	9	41	0
Nursery D (Yard 9)	8/15/2008	7	71	0
Nursery D (Yard 10)	8/15/2008	14	59	0

* Includes yard traps and loading dock traps.

** 214 of the 318 positive traps were a result of a one-time spike on July 14, 2008. (Refer to Holds/Treatments)

In 2008, seven nursery yards out of a total of 15 had 344 positive traps (>10 GWSS).

The following table summarizes the trapping results January 1 through June 5, 2009:

Nursery	Date ATP	Acreage in Production	Number of Traps*	# of Traps > 10 GWSS
Nursery A	5/15/2008	150	688	10
Nursery B (Yard 1)	6/6/2008	290	1256	15
Nursery B (Yard 2)	6/6/2008	111	469	0
Nursery C (Yard 1)	7/15/2008	126	619	0
Nursery C (Yard 2)	7/28/2008	20	88	0
Nursery D (Yard 1)	8/15/2008	25	110	0
Nursery D (Yard 2)	8/15/2008	27	122	0
Nursery D (Yard 3)	8/15/2008	1	7	0
Nursery D (Yard 4)	8/15/2008	6	31	0
Nursery D (Yard 5)	8/15/2008	10	40	0
Nursery D (Yard 6)	8/15/2008	2	12	0
Nursery D (Yard 7)	8/15/2008	8	34	0
Nursery D (Yard 8)	8/15/2008	9	41	0
Nursery D (Yard 9)	8/15/2008	7	71	0
Nursery D (Yard 10)	8/15/2008	14	59	0
Nursery E (Yard 1)	2/9/2009	11	60	0
Nursery E (Yard 2)	2/9/2009	6	25	0
Nursery E (Yard 3)	2/9/2009	4	24	0
Nursery E (Yard 4)	2/9/2009	8	73	0
Nursery E (Yard 5)	2/9/2009	11	44	0
Nursery E (Yard 6)	2/9/2009	9	39	0
Nursery E (Yard 7)	2/9/2009	6	26	0
Nursery E (Yard 8)	2/9/2009	13	53	0
Nursery E (Yard 9)	2/9/2009	1	10	0
Nursery E (Yard 10)	2/9/2009	4	19	0

* Includes yard traps and loading dock traps.

As of June 5, 2009, two nursery yards, out of a total of 25, had 25 positive traps (>10 GWSS).

Holds/Treatments

All nurseries are notified by county agricultural staff of traps containing more than 10 suspect GWSS on the day such traps are inspected. A 300-foot radius around each positive trap (>10 GWSS) is placed on hold, pending confirmation of the trapped suspect GWSS by a CDFA or county entomologist. Once confirmation has been received, all areas on hold will receive a chemical treatment with a chemical registered for GWSS and nurseries. All treatment applications for trap areas on hold are supervised by county staff. At times, nurseries will wait two or three trap cycles before treating if citrus harvesting or other activities will lead to re-infestation. This occurred in Nursery B (yard 1) on June 6, 2008. Because of citrus harvesting near by, the nursery elected to postpone treatment on the hold areas until harvesting activities ceased. No plant material was allowed to move from within areas under hold. Once the GWSS

pressure is reduced, an insecticide treatment is applied and areas are released from hold after two subsequent trap cycles below the 10 GWSS per trap threshold.

Treatment Monitoring/Improvement

All nursery stock being shipped under this program must be treated with either carbaryl (Sevin SL) or fenpropathrin (Tame). Each treatment must be witnessed by a licensed county inspector throughout the entire process from the mixing/loading to the spraying of the very last plant. An inspector will issue the signed CQC with the treatment information, attesting that he/she witnessed the treatment.

Origin counties and nurseries have been working together to ensure treatments achieve adequate coverage of plant material destined to non-infested areas. Adjustments have been made to address the spacing of the plant material to ensure thorough coverage. Application methods may vary slightly for each location and combination of plants. The nursery industry has explored the use of treatment wands and pressurized hand guns to produce optimal spray coverage for a myriad of plant material situations. Any new information will be added, by program staff, to the BMP manual found on the PDCP website at: <http://www.cdfa.ca.gov/Nursery.html>

Any new information will be forwarded to the participating nurseries by their respective County Agricultural Commissioner.

Water sensitive paper (wsp) is used in this program to evaluate spray coverage during application. Sheets of wsp are placed strategically within the nursery stock shipment at various heights and then checked after treatment. They are also placed at various locations on the plants, such as the outside, middle, and inside of the foliage. At the beginning of the program, wsp was used for each nursery's initial treatment. It is now used by the nurseries as a quality control check. PDCP staff also check each participating nursery using wsp a minimum of once a month. This is done on an unannounced random basis. PDCP is in the process of streamlining this practice by establishing guidelines for staff to ensure verifiable and equitable monitoring of all nurseries in the long term.

In conjunction with the increased use of wsp comes the possibility of increased pesticide exposure. Testing to establish a baseline cholinesterase level for staff retrieving the wsp has been completed for PDCP staff in accordance with requirements for working with Sevin, a carbamate insecticide.

Insect Rearing Sleeves

Monitoring

During training sessions, insect rearing sleeves were offered to any county agriculture department wanting to sleeve egg masses found in ATP shipments. Sleeves were distributed to the following counties: Alameda, Amador, Calaveras, Contra Costa, El Dorado, Imperial, Lake, Monterey, Nevada, Placer, Sacramento, San Joaquin, San Luis Obispo, San Mateo, Santa Clara, Santa Cruz, Shasta, Solano, Sonoma, Stanislaus, and Yolo.

Results

Three counties sleeved suspect egg masses from ATP shipments in 2008. The results are as follows:

Date Collected	Origin Nursery	Destination County	Host & # of Egg Masses	Treatment	Fate	Date Released
7/17/2008	Nursery B	San Luis Obispo	<i>Arbutus</i> sp. (4) <i>Koelreuteria</i> sp. (2)	Sevin SL	Dead	7/28/2008
9/12/2008	Nursery C	Imperial	<i>Lagerstroemia</i> sp. (4)	Sevin SL	Dead	9/15/2008
9/18/2008	Nursery C	Imperial	<i>Ficus</i> sp. (2)	Sevin SL	Dead	9/22/2008, 9/25/2008
10/11/08*	Nursery C	Solano	<i>Lagerstroemia</i> sp. (1)	Sevin SL	Dead	11/3/2008

* Not reported in the first six month review.

During the first half of 2009 (January 1st through June 5th), three counties have sleeved suspect egg masses from ATP shipments. PDCP will continue to discuss the importance of sleeving with destination counties and encourage them to sleeve plant material where practical. The results are as follows:

Date Collected	Origin Nursery	Destination County	Host & # of Egg Masses	Treatment	Fate	Date Released
03/27/2009	Nursery A	San Luis Obispo	<i>Photinia</i> sp. (1)	Sevin SL	Dead	04/03/2009
04/30/2009	Nursery A	Alameda	<i>Pittosporum</i> (1)	Sevin SL	Alive ¹	Suspended 05/07/2009
05/20/2009	Nursery E	San Luis Obispo	<i>Buxus</i> sp. (1)	Tame	Dead	06/02/2009
06/03/2009	Nursery E	San Luis Obispo	<i>Rhamnus</i> sp. (2)	Tame	Dead	06/05/2009
06/03/2009	Nursery C	Imperial	<i>Bougainvillea</i> sp. (1)	Sevin SL	Dead	06/15/2009
06/03/2009	Nursery C	San Luis Obispo	<i>Distictus</i> sp. (1)	Sevin SL	Dead	06/18/2009
06/18/2009	Nursery B	Imperial	<i>Melaleuca</i> sp. (3)	Sevin SL	Dead	06/22/2009

¹ There was one regulatory response during the timeframe for this report.

Regulatory Response

On May 4, 2009, PDCP staff was notified by Alameda County of the discovery of emerging nymphs from a sleeved egg mass. It was found on a nursery stock shipment from Nursery 'A'. The nymphs were sent to the CDFA's Plant Pest Diagnostics Center and were confirmed as GWSS. Consequently, Nursery 'A' was suspended from

shipping nursery stock to non-infested areas directly or through yard transfers, per ATP protocol. During the suspension, Nursery “A” had approximately 12-16 shipments cancelled costing the nursery approximately \$150,000.00.

A joint investigation by PDCP and Ventura and Alameda counties determined that the species of plant material (*Pittosporum*) containing the egg mass that yielded the GWSS nymphs had been removed from an area of the nursery yard subject to a hold due to a yellow panel trap containing more than 10 GWSS adults. It was also discovered that the required 300-foot radius treatment for a trap find >10 adults was not conducted in this area of the nursery. Interviews were conducted with both Ventura and Alameda County staff, nursery employees including truck drivers and applicators as well as nursery management.

Pesticide residue analysis by the CDFA Center for Analytical Chemistry and a private laboratory in Alameda County discovered the carbaryl residue levels on the leaves of the *Pittosporum* plants from the shipment were between 0-1.3 ppm (parts per million) indicating an inadequate treatment.

A Notice of Proposed Action (NOPA) was issued by Ventura County against Nursery “A” for the sum of \$2,500.00. Nursery “A” has paid the fine in full.

Nursery ‘A’ has been reinstated by the Ventura County Agricultural Commissioner to ship nursery stock to the non-infested areas of California under the following conditions:

- A new Nursery Stock Approved Treatment Program (ATP) Compliance Agreement shall be issued.
- Treatment of all quarantine hold areas based on trapping records starting from February 2009 to the present is required. Treatment of these areas is required to be monitored by a licensed inspector from mix/load to end of application. Any future hold areas will be immediately identified, treated, and closely monitored for reduction in trap finds.
- Quarantine hold areas will be marked visually in the field for Nursery ‘A’ employees to be able to identify.
- Invoices and/or shipping manifests must include identification of blocks from which plant material is being pulled. This would eliminate any possibility of plant material on hold from being shipped.
- To prevent any potential conflicts in information, Nursery ‘A’ is required to fax trapping results on a bi-weekly basis to the Ventura County Agricultural Commissioner’s office.

Pesticide Residue Sampling

A number of destination counties expressed, early on in the program, an interest in conducting random pesticide residue testing to confirm the plants were appropriately treated. Sevin SL (carbaryl) is analyzed by high pressure liquid chromatography (HPLC) and Tame (fenpropathrin) is analyzed by gas chromatography (GC). Counties wishing to conduct residue sampling of ATP plant material can submit their samples to CDFA’s Laboratory or to any of the Environmental Laboratory Accreditation Program

(ELAP) laboratories found on the California Department of Public Health website at: <http://www.cdph.ca.gov/CERTLIC/LABS/Pages/ELAP.aspx>.

The PDCP will continue to encourage counties to submit residue samples, if they are interested. The cost of analyzing the sample, however, cannot be invoiced against their existing contract.

Chemical Evaluation

Research trials have been accepted and are ongoing to evaluate additional insecticides for use with the ATP program. The objective of the research trials is to evaluate four additional insecticides for nursery stock treatment against the GWSS. Two of the insecticides, deltamethrin and acetamiprid, were shown to be successful at killing recently emerged GWSS nymphs in the original trials conducted in 2003-2004. However, it was not determined when the mortality occurred. Cyfluthrin has been substituted for deltamethrin because it is no longer available to the nursery industry. These trials will attempt to establish the timing of nymphal mortality when these chemicals are used.

Two new chemicals, spirotetramat and spinetoram, will also be tested for their efficacy against the GWSS. Currently they are being used in the Asian Citrus Psyllid (ACP) program and have shown efficacy against a broad spectrum of sucking insects. Their efficacy against sharpshooter eggs and emerging nymphs is unknown.

Additionally the trials will evaluate:

- The individual and combined effects of insecticide treatments and parasitism.
- The effect of overhead irrigation on insecticide efficacy and parasitism.
- The chemical residue levels of the treated plant material.

County Training

PDCP provides annual nursery inspection and regulatory training to county agriculture departments. The Approved Treatment Program is now part of the annual training presentations. Since January 2009, 232 staff members from 37 counties have received training.

Trans-shipments / Blended Shipments

As reported in the first progress report dated January 2009, the following statement was incorporated into all ATP nursery GWSS Management Plans and remains in effect:

Incoming shipments of nursery stock will be from locations that have a current Compliance Agreement with the Glassy-winged Sharpshooter / Pierce's Disease Control Program. Additionally the following will apply:

- *From a Non-infested Premise or Approved-Treatment Nursery*
 - *Nursery stock will be accepted "as is"*
- *From an Infested Premise Nursery*
 - *Nursery stock will be cleaned of all GWSS life stages by nursery staff prior to arrival*

OR

- *The receiving nursery will establish a quarantine area for the incoming plants and the plants will be monitored using yellow sticky traps at a density of 2 traps per ½ acre for a period of no less than 4 weeks. The quarantine area will be a constant area approved by the County Agricultural Commissioner. ATP protocols will apply to any trap finds.*

County Workload Issues

Most destination counties have reported minimal changes to their workload since the implementation of the ATP. Counties are still visually inspecting these loads, so the workload differs very little from a typical infested premise nursery shipment. Destination inspection remains optional and PDCP anticipates that as the program evolves over time, workloads at destination will decrease.

Origin counties are saving money with this new program as they are using fewer personnel than with the original infested premise nursery program. For example, the chart below reflects data for the 6-month time periods immediately before and after implementation of ATP for two participating nurseries in Los Angeles County:

	Master Permit Hours 02/15/08 – 08/14/08	Number of Shipments 02/15/08 – 08/14/08		ATP Hours 08/15/08 – 02/14/09	Number of Shipments 08/15/08 – 02/14/09
Nursery D	5,280 hours	715 shipments		1,218 hours	404 shipments
	7.38 hours/shipment	0.011 hour/plant		3.01 hours/shipment	0.010 hour/plant
	Master Permit Hours 08/23/08 – 02/22/09	Number of Shipments 08/23/08 – 02/22/09		ATP Hours 02/23/09 – 08/22/09	Number of Shipments 02/23/09 – 08/22/09
Nursery E	2,412 hours	271 shipments		736 hours	406 shipments
	8.90 hours/shipment	0.050 hour/plant		1.81 hours/shipment	0.010 hour/plant

The data indicates time expenditure reductions as follows:

Nursery D: 59.2% reduction in per-shipment inspection time

Nursery E: 79.7% reduction in per-shipment inspection time

County Concerns/Feedback

On May 22, 2009 it was brought to the PDCP staff's attention by San Luis Obispo County that some of the sleeved egg masses had successful parasite emergence during the observation periods. The staff consulted with Dr. Redak. It was his conclusion the egg masses were stung prior to the treatment. The wasps developed.

During emergence, it is possible that the wasp is able to avoid contact with the plant. GWSS never avoid contact with the plant upon emergence. It is also possible the plant containing the egg masses received an inadequate treatment but was heavily parasitized such that no live GWSS emerged.

On June 2, 2009 Monterey County notified PDCP staff regarding a residue analysis of 3.5 ppm on plants shipped from Riverside County. The staff contacted the origin county and discussed the situation. It was recommended to increase the spacing between the pots and to have the nursery treatment crew be more diligent with the application.

Changes to Protocol and BMP Manual

During the current shipping season, two additions were made to the protocol. One addition to the protocol concerned the loading dock. The following statement was added to 2e: "Nurseries shall maintain a free-from loading dock." The second addition to the protocol can be found in 4b regarding using the maximum label rates for the chemicals.

The above changes are reflected on the PDCP's website at:

<http://www.cdfa.ca.gov/pdcp>.

Future Considerations

Hold and Treatment Radius Reduction

- The PDCP is considering a hold and treatment radius reduction from 300 feet to 200 feet. This issue will be discussed after a full year of ATP data is available for review.

Trap Reduction

- After one complete year of monitoring trap data at a trap density of two per ½ acre, a modification of trap density should be applied to all yards that exhibit less than 10% of traps resulting in holds. The CAC should take into account that the pest pressure exhibited is limited to perimeter pressure and consistent hot spots. Any trap with 10+ GWSS found should have two traps per ½ acre in the area within 300 feet of that trap.

Dye Investigation

- The use of fluorescent dyes as proof of pesticide coverage is still being researched at the time of this report.

Items to Remain Unchanged Until End of One-Year Review Period

- Holds to occur at a threshold of more than 10 GWSS per trap. Traps physically maintained by CAC staff.
- During the initial year in the program, nurseries should be trapped at a rate of two traps per ½ acre, evenly spaced throughout the nursery.
- Continued monitoring and oversight performed by PDCP staff, including review of trapping data and random checks of treatments.

Please direct any questions regarding this report to Greg Morris at gmorris@cdfa.ca.gov or at (916) 651-0262 or (530) 547-2312.